Serial No. 09/446,641

AMENDMENT

In the specification

Please replace the paragraph beginning at page 1, line 11, with the following rewritten paragraph:

--In recent years, many portable electronic apparatuses such as an integral VTR/video camera unit, portable telephone, portable computer, etc. have been proposed, and they show a tendency to be more compact for their improved portability. Many developments and studies have been made to provide a thinner or bendable battery, more specifically, a secondary battery, or a lithium ion battery among others, for use as a portable power source in such a more compact portable electronic apparatus.--

Please replace the paragraph beginning at page 1, line 18, with the following rewritten paragraph:

--To attain such a thinner or bendable battery structure, active studies have been made concerning a solidified electrolyte for use in the battery. Especially, a gel electrolyte containing a plasticizer and a polymeric solid electrolyte made from a high molecular material having lithium salt dissolved therein are attracting much attention from many fields of industry.--

Please replace the paragraph beginning at page 5, line 10, with the following rewritten paragraph:

--It has been found that the molecular weight of a fluorocarbon polymer used as a matrix polymer in the solid electrolyte has a great influence on the characteristics of the electrolyte, use of a fluorocarbon polymer having a large molecular weight makes it possible to adhere a high molecular solid or gel electrolyte to the active material of the electrodes with a sufficient strength and provide good electrical contact between the solid or gel electrolyte and the active material of the positive and negative electrodes, and that use of such a fluorocarbon polymer provides a solid-electrolyte secondary battery having a longer charge and discharge life cycle and excellent productivity.--

Please replace the paragraph beginning at page 6, line 8, with the following rewritten paragraph:

B4

--According to the present invention, a fluorocarbon polymer of 550,000 or more in weight-average molecular weight (Mw) is used as the matrix polymer. The fluorocarbon polymer of 550,000 or more in weight-average molecular weight assures an excellent adhesion of the electrolyte to the active material of the positive and negative electrodes. Therefore, it is possible to adhere the high molecular solid or gel electrolyte to the active material of the electrodes with a sufficient strength and thus reduce the internal resistance of the electrodes, thereby attaining an improved charge and discharge life cycle of the battery.--

Please replace the paragraph beginning at page 8, line 17, with the following rewritten paragraph:

B5

--In case a fluorocarbon polymer of 550,000 or more in weight-average molecular weight (Mw) is used, another fluorocarbon of over 300,000 and under 550,000 in Mw may be used in combination to lower the viscosity for facilitating to form a film of the electrolyte. In this case, however, the ratio of the fluorocarbon polymer of 550,000 or more in Mw should preferably be 30% or more by weight. If the ratio of the fluorocarbon polymer of 550,000 or more in Mw is lower, it will be difficult to ensure an intended sufficient adhesive strength of the solid electrolyte.--

Please replace the paragraph beginning at page 9, line 17, with the following rewritten paragraph:

B6

--The hexafluoropropylene or ethylene tetrafluoride may be totally added into a polymerization container during the initial charging. Otherwise, it may partially or wholly be added in a divisional or continuous manner to the polymerization container after the initial charging.--

Please replace the paragraph beginning at page 9, line 21, with the following rewritten paragraph:

B7

--A chain transfer agent used at this time includes acetone, isopropyl acetate, ethylacetate, diethyl carbonate, dimethyl carbonate, baked ethyl carbonate, propionic acid, trifluoroacetic acid, trifluoroethyl alcohol, formaldehyde dimethyl acetal, 1, 3-butadiene epoxide, 1, 4-dioxane, β-buthyl lactone, ethylene carbonate, vinylene carbonate or the like. Among them,

however, acetone or ethylene acetate should preferably be used for easy availability and handling.--

Please replace the paragraph beginning at page 12, line 1, with the following rewritten paragraph:

--The solid or gel electrolyte contains a lithium salt which may be used in ordinary battery electrolytes. More particularly, the lithium salt may be selected from lithium chloride, lithium bromide, lithium iodide, lithium chlorate, lithium perchlorate, lithium bromate, lithium iodate, lithium nitrate, tetrafluoro lithium borate, hexafluoro lithium phosphate, lithium acetate, bis(trifluoromethane sulfonyl)imide lithium, $LiAsF_6$, $LiCF_3SO_3$, $LiC(SO_2CF_3)_3$, $LiAlCl_4$, $LiSiF_6$, etc.--

Please replace the paragraph beginning at page 12, line 7, with the following rewritten paragraph:

--These lithium salts may be used singly or in combination as mixed together, but among them, $LiPF_6$ and $LiBF_4$ should desirably be used for oxidation stability.--

Please replace the paragraph beginning at page 13, line 6, with the following rewritten paragraph:

--The positive electrode may be formed from a metal oxide, metal sulfide or a special high molecular compound used as a positive electrode active material depending upon an intended type of battery. For a lithium ion battery, for example, the positive electrode active material may be a metal sulfide or oxide containing no lithium such as TiS_2, MoS_2, $NbSe_2$, V_2O_5 or the like, or a lithium composite oxide or the like containing as the base $LiMO_2$ (M is one or more kind of transition metal, and x differs depending upon the charged or discharged extent of the battery, normally over 0.05 and under 1.10). The transition metal M composing the lithium composite oxide should preferably be Co, Ni, Mn or the like. More particularly, the lithium composite oxides include $LiCoO_2$, $LiNiO_2$, $LiNi_yCO_{i-y}O_2 (0<y<1)$, $LiMn_2O_4$. These lithium composite oxides can be a positive electrode active material generating a high voltage and providing excellent energy density. The positive electrode may be formed from more than one of these active materials. For forming a positive electrode from any of these active materials, a well-known conducting material, binder or the like may be added to the active material.--

Please replace the paragraph beginning at page 14, line 7, with the following rewritten paragraph:

B11

--The following monomers and auxiliaries were charged into a pressure-resistant autoclave made of a stainless steel and having a volume of 14 liters, and the polymerization was started at a temperature of 25°C:--

Please replace the paragraph beginning at page 15, line 12, with the following rewritten paragraph:

B12

--A Ubbelohde viscometer was used to measure an efflux time at 30°C of a solution in which the powder of the polymer was dissolved in dimethyl formamide at a concentration of 4 g/liter. The following equation was used to calculate a logarithmic viscosity number from the measured efflux time:--

Please replace the paragraph beginning at page 16, line 11, with the following rewritten paragraph:

B13

--To produce a positive electrode active material ($LiCoO_2$), lithium carbonate and cobalt carbonate were mixed at a ratio of 0.5 mol to 1 mol and sintered in the atmosphere at 900°C for 5 hours. Ninety one parts by weight of the $LiCoO_2$ produced, 6 parts by weight of graphite as a conducting material and 10 parts by weight of vinylidene fluoride/hexafluoropropylene copolymer were mixed together to prepare a positive electrode mixture. The mixture was further dispersed in N-methyl-2-pyrolidone to produce a slurry. The slurry was applied uniformly to one side of an aluminum foil stripe of 20 μm in thickness used as a cathode collector. After the slurry was dried, the aluminum foil stripe was compressed and formed by the roll press to produce a positive electrode.--

Please replace the paragraph beginning at page 22, line 1, with the following rewritten paragraph:

B14

--The experimental embodiment 6 having a fluorocarbon polymer of 2,000,000 in weight-average molecular weight (Mw) is excellent in peel strength and output maintenance factor as shown, but it showed a productivity not so good because of its high viscosity.--

Please replace the paragraph beginning at page 22, line 5, with the following rewritten paragraph:

--As having been described in the foregoing, the present invention can provide a solid electrolyte excellent in adhesion to the electrode active material layers, and thus the present invention can also provide a solid-electrolyte secondary battery with a solid electrolyte having a good electrical contact with positive and negative active material layers and having a considerably improved charge and discharge life cycle.--

B15

Please replace the paragraph beginning at page 25, line 2, with the following rewritten paragraph:

--A solid-electrolyte secondary battery is provided which comprises a positive electrode, negative electrode and a solid electrolyte provided between the electrodes. The solid electrolyte contains as a matrix polymer a fluorocarbon polymer of 550,000 in weight-average molecular weight (Mw). The fluorocarbon polymer having a weight-average molecular weight of more than 550,000 shows an excellent adhesion to the active material layers of the positive and negative layers. Therefore, the high polymer solid (or gel) electrolyte adheres to the active material layers of the electrodes with a sufficient adhesive strength. A fluorocarbon polymer having a weight-average molecular weight (Mw) over 300,000 and under 550,000 may be used in combination with a fluorocarbon polymer of 550,000 or more in weight-average molecular weight to lower the viscosity for facilitating the formation of a film of the electrolyte.--

B16

<u>In the Claims</u>

Please amend Claims 10-12 and 14-16 as follows:

B17

10. (Once amended) A solid-electrolyte secondary battery comprising:

a positive electrode;

a negative electrode;

a solid electrolyte comprising a matrix polymer comprising a fluorocarbon polymer having a weight-average molecular weight of greater than 572,500.

11. (Once amended) The solid-electrolyte secondary battery of Claim 10 wherein the matrix polymer further comprises a second flurocarbon polymer having a weight-average molecular weight of greater than 300,000 and less than 550,000.